THE LOGGER'S BARK

1916 - RADIO CLUB OF TACOMA - 2016

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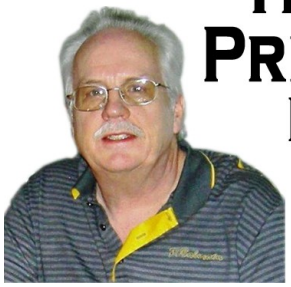

THE RCT PRESIDENT'S REPORT

BY GARY MCADAMS WG7X

Hello Club members!

Greetings from Beautiful Downtown Lakewood Warshington…

Today's topic, or should I say this month's topic is: TIME. Time: some of you have a lot of it, some not. I'm not talking about waiting for the grim reaper or anything like that! But the fact of the matter is that some of you have a bit more "disposable time" than those of us who are still in the making-a-living rat race.

So what you ask? Well I would ask you a question back? What are you doing with all that free time? Have you considered taking up a position at the Radio Club? (We still need a treasurer!) Have you gotten on the air and worked any new and exotic DX? (Exotic is a variable, each one of us has a different definition...) Maybe you have tried one of those weird digital modes warbling away at the bottom of some radio band? Maybe you just wish to just stay at home with the people that like you?

All good things, to be sure, and if staying home is your thing, so much the better! If you have done anything that you consider new, fun, or interesting, why not share it with your fellow club members, either at the monthly general meeting on the second Wednesday of each month, or at one of the monthly workshop meetings that are on the fourth Wednesday of each month?
Either way if you do something that gives you joy, please consider sharing it with the group. We promise to be good listeners! And not waste your precious time!

73 Gary WG7X,
President, RCT

UPCOMING NOTABLE CLUB ACTIVITIES

3/23, Weds 7:00 PM Clubhouse Activity Night
4/6, Weds, 7:00 PM Club Officers Board Meeting
See w7dk.org for more details….
4/12, Tues, 7:00 PM, VE Testing at Clubhouse
4/13, Weds, 7:30 PM– Club Meeting. See w7dk.org
4/10, Thurs… Bark Submission Deadline
4/27, Weds, 7:00 PM Clubhouse Activity Night
5/?? Sat, Hidden Transmitter Hunt. TBD

Weblo Scouts at Techno-camp hunting hidden tramsimtters provided W7DK volunteers. 10/2011

Great Caesar's Ghost

by Rich KR7W - Bark Editor

Direct from the W7OS Museum's Telegraphers Desk- Comes March 2016's Loggers Bark…

Greetings Gentle Readers[**LINK**]… Last month Dave W7UUU provided me with photos of his two part ham radio room to appear in the Hamshack of the Month column. Last month his "Novice Corner" was featured. This month you can read all about the rest of his well laid out and functional collection of radios he regularly uses on many bands and modes. Dave generously took a lot of time and we emailed back n forth to provide the Bark with detailed descriptions of what's on his shelves….Thanks!

Randy WB4SPB also generously provides us with Part Deux in his series on antenna modeling using NEC software. [Ed Note: See Feb 2016 Bark **[LINK]** for Part 1 of this nicely done article] This technical article will prepare the reader for his second session of Antenna Modeling training to be presented on March 23rd's Weds Activity Night at the W7DK clubhouse. **Www.w7dk.org** will clue you in.

This months 'Around the Clubhouse' column features the Radio Club's Property Management Team– a very important committee in our club– whose efforts feed the club's coffers to keep it in business and provide us with coffee and donuts each Saturday as well as pay the property taxes and electricity bill. Next time you see a PMTer… tip your ham radio hat the tell them thanks for all they do.

The Loggers Bark staff is 'wishing and hopin'**[LINK]** that more of it's readers will contribute some ideas and/or articles to be published for readers to ponder and perhaps even enjoy.

The Bark staff has learned that 'Hamshack of the Month' is very popular with readers– So snap a photo of your radio set up– in your home shack or your mobile station- with your smart phone or digital camera and email it. In the email– include a few lines of that describes what's in the image. No hamshack is too small or insignificant or too large for the Bark.

But Wait! There's more Wishing and Hopin' for ideas and even articles for the Hints n Kinks column. Any tidbit of info regarding how you do this or that to make ham radio better for you. Simple– like the dot of red paint on your rigs volume control… or complex like modifying your Auto Antenna Tuner.

Also readers– what have you discovered that's What' New in Amateur Radio? Some item or idea that is 5 years old is 'new' in the 116 year history of amateur radio. If you've discovered it then it's newsworthy– so please let the Bark know. The **curse** of **"I cant get that (Dusty Springfield) song out of my head"** will be lifted once you contribute to the Bark– I promise.
KR7W Email Here **[LINK]**

Planned for upcoming Bark newsletters will be: What's Behind That Door– In the Museum… as well as an article about the club's Library, the Lending Library (to be christened "The Doug Demaw Collection",

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Hamshack of the Month

by Contributing Members

Welcome to Dave– W7UUU's shack. Bottom Shelf– L to R: Icom IC-5P power supply w/ PWR MTR on top, Heathkit HD-10 Keyer, Heathkit HW-9 w/ WARC, MFJ-9600 QRP rig, Elecraft K-1 QRP rig, BNC patch panel (behind the Mic) for antenna selection; Yaesu FT-950 (big rig). PC Monitors for N3FJP Logging + QRZ lookups and DX spots. Older I-Pad used as UTC Clock. Mini monitor connected to Raspberry Pi PC for Gray Line viewing.

Middle Shelf– L to R: HC-10 Homebrew Station Console which connects to adjacent restored Heath HG-10 VFO and Heath HW-16 transceiver. Above the Yaesu FT-950 is the matching speaker, then Kenwood AT-180 manual antenna tuner and a Timewave DSP-59+ for the FT-950. Kenwood TS-440S used as a SWR radio. Above the DSP-59+ reside a MFJ-464 Contest Keyer and a Autek QF1-A active audio filter.

Beginning with the Larger Monitor (center of photo)- used for JT digital modes and as a SDR Panadapter with the FT-950. In the cubbies below the On The Air sign are Radio Shack HTX-100 CW/SSB used for 10 meter beacon transmitter, Uniden Trunk Tracker III scanner, Yaesu FT-7900 2M/70cm primary VHF rig. The horiz cubbies above the twin monitors house– Heath HW2036 antique 2M rig, homebuilt LED digital clock. In large cubbie above lower Right PC monitor are: Kenwood TR-9130 2M All-mode for CW + SSB in contests, Mirage B-2518G 160W amp, Homebrew 2M brick amplifier.

Top L shelf: Yaesu G650 rotor for 6M/70cm beams, Drake R4A for 30M w/ Heathkit HW-8 on top, Yaesu G800 rotor for HF + 2M beams.

Daves Antennas: 160M Inverted-L 1/2 Wave Length. 80M Inv Vee fed w/ ladder line for 80/40/30 meters; 3 element Mosley beam for 20/15/10 meters; a 17/12 meter rotating trap dipole; 1/4 WL vertical– 8 ft high for 10M beacon; 5 element Cushcraft beam for 6M; a 10 element vertical beam and a 5/8 WL monopole for 2 meter FM; A Horiz 9 element M Squared beam for 2M CW+SSB; and a 11 element M Squared beam for 70 cm.

AROUND THE CLUBHOUSE
PAST, PRESENT & FUTURE INFO

The Property Management Team- aka PMT- is a group of club member volunteers that performs many important tasks to support our radio clubs continued existence.

The PMT inventories and keeps records of the Club's non-real estate assets for insurance replacement purposes. Examples might include the clubs stove and refrigerator, HF Station radio equipment, AC Back Up Generator, and any other item that has a replacement value.

This very secure door with two locks and non-removal hinges is the entrance to PMT's Lock Up Room where inventoried items of value are stored.

PMT is responsible for receiving donations of equipment from generous benefactors- such as surviving relatives of silent key hams. These donations are stored until the team can get together to determine if the donation has any value to the club. If the item is deemed to have value then a property number is assigned, affixed and recorded in a spreadsheet. If the item has no value then it may be placed on the Free Table or disposed of properly.

PMT circulates a description of the newly inventoried property to the various other committees in the club to see if they have a need for such an item. Example 1: A donated 1927 ARRL Radio Handbook might be a good addition to the clubs library. The Library committee will claim the item into their inventory and PMTs records will show as such. Example 2: PMT receives a donation of a 100W Dual Receiver Elecraft K3. It will inventoried and circulated through the various committees. The HF station committee would most likely claim this radio for use in the Jerry Room or save it for Field Day. In all cases– PMT will then issue a paper receipt of the items (sometimes their condition will be noted) to the donor for income tax purposes.

If none of the committees have use for the donated item then it is considered surplus and PMT can do what they think is best. PMT could decide to sell it to make money for the club or place the item into the Loaner Program for members to borrow.

If PMT decides to sell an item– they must determine its dollar value. If the item is worth more than $30 then PMT must present the item for RCT Board approval to sell it. PMT might present a list of many items for approval to sell right before a hamfest that PMT will be attending– like Mike and Key.

In most cases PMT will determine the working condition of the item. Some PMT members take items to their home workbench or hamshack to determine the technical condition of the item. If possible the PMT equipment tester will attempt to repair an item if it's needed. A report is written and placed with the equipment to help determine a sales price and give potential buyers more information.

Go to next page….

PMT will determine best way to sell each item. Some small items like classic microphones, Rig Interfaces, Iambic Paddles or keys are best for eBay sales. PMT manages the eBay team (a couple of member/volunteers who have selling experience) who list the auctions and ship the items. The collected PayPal funds eventually end up in the Club's General Fund bank account.

Through the Lock Up door way– we see shelves of equipment and valuable clubhouse supplies. A generous gift from the RCT members (via the board members) purchased new wiring and lights for the garage to make it easier to do business here.

Some items of value might be set aside for a 'Members Only Auction' or raffled at a Club Meeting or taken to a nearby hamfest. All of this effort sells items to raise money for the club.

PMT manages a Loaner Program for Club members to borrow ham equipment for a short duration– either to try it out or to replace a radio that is sent to a repair facility. Items for loan include: HF Transceivers, Antenna Tuners, 2 Meter FM base stations with power supply, antennas and other miscellaneous items. A whole HF station– less the antenna could be borrowed. The Loaner Program rules are on the w7dk website in the members area.

PMT Sales over the last years Time...

2015 March Mike and Key	**$1,419.50**
2015 July Chehalis Hamfest	**$1,155.00**
2016 January Mineral AMers	**$425.00**
2016 Feb 27 Tailgate Sale	**$375.00**
2016 March Mike and Key	**$1233.00**
It adds up to…	**$4607.50**

So far in 2016- PMT club member/volunteers have attended The Mineral (boat anchor) AM Groups hamfest and the Mike and Key Hamfest– which included a club member "Tailgate" pre-sale at the club house.

The PMT crew is made up of these members: Bob K7MXE, Jack K7DBU, Paul W7PFU, Red WB7EC, Greta KF7KSW, Bruce WE7P and Mike W7MWF. The eBay volunteers are Jim W7ZND and Andy KE7RTB.

Hey!! Want to join up and be part of this outfit? Let one of the Team know.

L & R Photos: Lots of old stuff– Junk to most, but treasure to hams who like to restore old equipment. Some was of what's seen here was sold at Mike and Key. A few (not for sale-non operational) Museum items reside in PMT's LO Room also.

Continued on Next Page….

Around the Clubhouse Cont'd...

At Mike and Key– PMT had 2 sales tables– Team members Jack K7DBU and Bob K7MXE are on high alert to reel in a potential buyer. $1200+ ended up in the cashbox for their effort. Not pictured is Bruce WB7EC.

Attending the RCT Table in the Club area of the M&K are Larry KD4VOM, Gretta KF7KSW, and BC Bob N7NCP ready to pounce on potential new members or Technician Class participants.

Bark Editor's Blather from pg 2

and a 'In the Near Future' project to build a "Little Free Library"**[LINK]** to support amateur radio from the sidewalk.

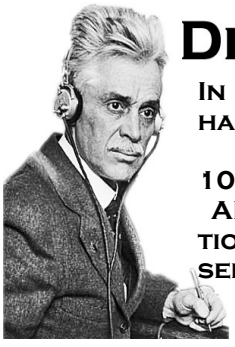
On Feb 25 I participated in ARRL's National Parks On The Air [aka NPOTA] from Mt Rainier National Park. It was a nice day between rain storms so I drove to the Carbon River Entrance (Buckley-Carbonado) with my fat tire bicycle to ride up to the old Ipsut Creek car Campground. The only access now-a-days is via bicycle or hiking what's left of the old gravel road. I never made it to the campground due to too many large fallen trees and the Carbon River displacing the road… but I did find a nice place to operate my QRP rig on a picnic table.

I had posted my intent to active NP41 on ARRLs Registered Events Page **[LINK]**– where NPOTA home chasers can see which ham are in which National Park Unit on what day, freq, etc. I advertised that I would use APRS to send a message that contained the frequency I was on.

On CW I had 30 or 40 hams calling me at once. My radios output was a blur of tone which made it hard to read anyone's call sign. For the most part the chasers were polite and orderly but it's always the LIDs and tuner-uppers that are memorable.

In my SOTA outings– I've not been very successful operating SSB. NPOTA was different. I made 14 SSB QSOs in a row on 20 Meters. The amateur radio community seems pretty involved in NPOTA– based on the enthusiastic turnout of stations to make contact with me. I was quite pleased with my 40 QSOs in a casual 90 minutes of operating and I will be back to Mt Rainier's Ipsut Creek when the trees are removed.

You can find out more about **ARRL's NPOTA HERE [LINK]**. Take some time and explore the NPOTA web pages. It's sorta catchy. 30 73 SK CL KR7W



DID YOU KNOW?

IN 1916 THERE WERE 6000 HAM RADIO LICENSES ISSUED?

1000 OF THESE HAMS WERE ARRL MESSAGE RELAY STATIONS. ARRL'S GOAL WAS TO SERVE OVER 150 CITIES TO ROUTE MESSAGES TO.

Hodge-Podge Page

The Page where there is too much white space that is filled with misc items

The Way-Back Machine takes us to RCT's 2005 Field Day– when it was at the Gun Club.

Here is Worth W7WG putting the finishing touches on his German Family Camping Tent. The funny thing was that only Mrs Worth knew how to correctly put it up.

This tent was used for many years as the 40M CW stations QTH.

The Gray Jay aka Camp Robber is related to the common Crow.

Ham - Ads

For Sale - WTB - Trade

For Sale: Icom CW filter. FL-100 Fits 706, 725, 575, 726, 729, 736, 737, 738, 746 and early 756. 500 Hertz CW filter plugs in to the chassis. $50.
Bob Heselberg k7mxe@yahoo.com[LINK]

For Sale: Icom V8000 2 Meter FM Transceiver. Comes with NMO Mag Mount with PL-259 and 1/4 wavelength whip antenna. $130 599kr7w@gmail.com[LINK]
Eham.net review here: http://www.eham.net/reviews/detail/2171[LINK]

For Sale: JPS / Timewave ANC-4 Antenna Noise Canceller. Use with HF rig to cancel locally generated noise received from your HF antenna. Comes with 12V wall wart. This unit is UN-tested, but believed to be good. $75
599kr7w@gmail.com[LINK]
Eham.net review here: http://www.eham.net/reviews/detail/1138[LINK]

TNT THE NEW THING

WHAT'S NEW AND NOTABLE IN HAM RADIO?

CONTRIBUTIONS BY READERS LIKE YOU

Something about Mobile Radio Shut-Off Timers by xxxxx

Have you ever forgotten to turn your mobile radio (or radios) off after you left your vehicle for the night and you found your battery dead the next day when you needed to go somewhere? A not so new car battery could drain dead overnight with the current draw of only one mobile radio left on for a day.

Newer commercial mobile radios (Motorola) have a lead called 'Ignition Sense' which is connected to a fuse in the vehicle fuse panel that switches the radio ON when the ignition key is in the ACC and RUN position. Amateur radios do not have this feature that I am aware of. The following gizmos provide automatic radio ON/OFF functions.

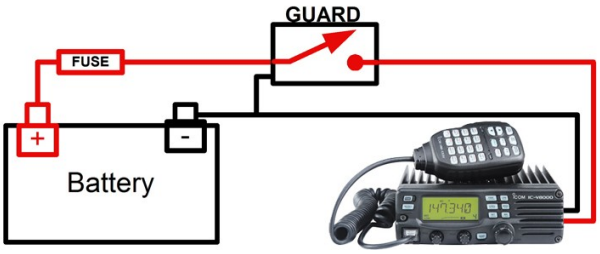
Here's a not-so-new– maybe new to you- and noteworthy product that you can install in your vehicle equipped with ham radios. This device automatically applies power to your radios when the car is running and then shuts down power a length of time after the car engine is shut off. Introducing the *Automotive DC Timer Guard or Charge Guard*. For the rest of this article I will refer to this device as *the 'Guard'*.

PowerWerx Automatic Power/Switch Timer. There's two models– one without Low Voltage Disconnect, the other with this feature.
Info here: Www.powerwerx.com[LINK]

This article explores two popular models as well as a Homebrew equivalent for the adventurous to build.

The Havis Charge Guard. The timer option switches can be seen in the opening.
Info here: www.havis.com[LINK]
Purchase info here: www.swps.com[LINK]

The Guard has a high current relay that operates when it senses the vehicle battery voltage to be high (say 14 VDC). The radios DC power feed is connected through the relay contacts and the radios turn on.



When the vehicle's engine is shut off– the battery voltage quickly lowers down to 12.7 volts. The Guards electronics senses the drop in battery voltage which triggers the start of a countdown timer. After the timer makes it to zero– the high current relay is released and power to the radios is removed. The length of the timer can be optioned by the user. 15 minutes is used by all of the hams I know who use a Guard. Some of the Guards

Continued next page...

have a START button to turn the radios on for a preset time length without having to start up the vehicle.

Most of the Guards have a 'Low Voltage Shutdown' feature– where the electronics are constantly monitoring the battery voltage. If the voltage drops below a preset amount while the timer is keeping the radios on… then the relay will release so the battery will not be drained any further. This feature assures that the driver will be able to start up the vehicle when it's time to make a get away.

New Guards cost around $65 to $75.

I picked up a bag of older model Charge Guards at a hamfest a few years back. The seller told me that they were out of police vehicles– when the new radios were installed all old components were replaced.

Sometimes older Charge Guards can be found on eBay or at Hamfests– but be aware that the electronics in the unit might be fried or water damaged.

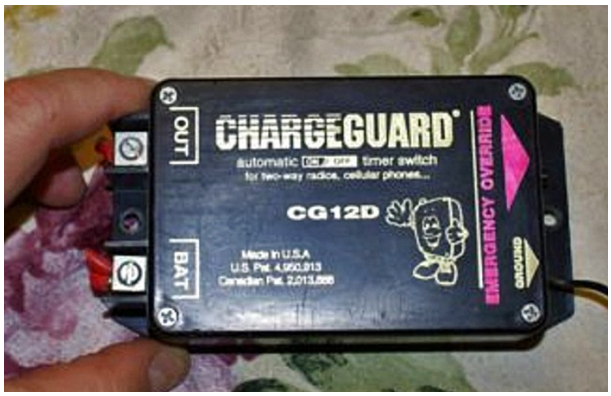
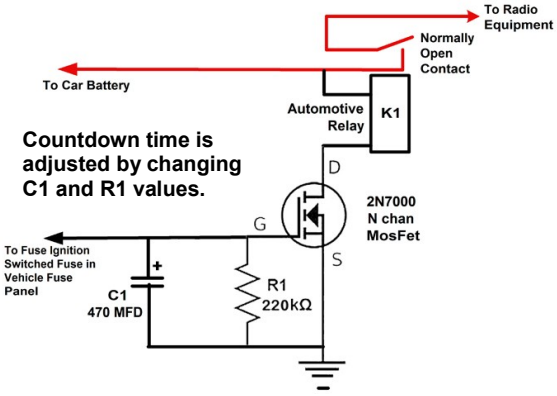


Photo of Old Style Charge Guard from an eBay listing. These units are vulnerable to water getting in to the electronic components if it was installed under the vehicles hood. Note the Pink Printing– EMERGENCY OVERIDE– the arrow points to a button that turns the unit on for 15 minutes without the engine running.

Caveat Emptor!

The adventurous home builder slash electronic experimenter can build their own radio shut off timer.

Circuit Description: When the ignition key is switched to the ACC or RUN position- +12V is applied to the G of the Mosfet via a Fuse Tap in the vehicles fuse panel (see image). This causes the FET to go to very low resistance between the S and D leads. +12V from the Car Battery flows through the K1 Relay coil through the D to S low resistance path of the FET which cause the relay to operate. The relay contact is now closed and +12V is applied to the Radio equipment.



When the Ignition Switch is turned to OFF, +12V is removed from the FETs G lead– but C1 is charged with +12V and slowly discharges by R1 across it. The time it takes for C1 to discharge down to approx 3 volts is the time that relay K1 will stay operated.

Fuse Tap and Automotive Relay

Parts, including an enclosure can be purchased from Jameco.com[LINK] or Mouser.com[Link]. Automotive relays and Fuse Taps are easy to find at Orielly's or Autozone. 30 73 SK CL

Antenna Modeling: Part 2 - by Randy Myers, WB4SPB

Cook up an Inverted Vee with a sprig of Trig

Last month we looked at the steps involved in modeling a simple dipole antenna. Since many hams find it more convenient to use this type of antenna in the inverted vee configuration, with a high center support and lower end supports, this month's article will examine techniques we can use to model sloping wires.

It is pretty straightforward to model a "flat-top" dipole with software such as 4nec2. We only need to describe a single wire, using two end points. By convention, we place the wire on the Y axis, so the X coordinate for both points is zero. If the length of ½ wavelength at the design frequency is LEN, then the Y coordinates are -(LEN/2) and LEN/2. The Z coordinate is the height above ground (call it HAG) and the same for both points. In other words:

X1	Y1	Z1	X2	Y2	Z2
0	-(LEN/2)	HAG	0	LEN/2	HAG

Since a dipole should be fed in the middle, we specify an odd number of segments for this wire and place a voltage source at 50% of the wire's length. This puts our feedpoint in the center segment of the wire. Specify the frequency and a ground (usually a "Moderate", "Real" ground), and we're pretty much done.

But suppose we want to model an "inverted vee" antenna. There are at least two complications:

1. Since modeled wires are straight, we'll need at least two wires to describe an antenna element with a bend in it. For an inverted vee, the wires are ¼ wavelength each and the bend is normally in the middle, but that's also where the feedpoint should go. How shall we arrange to feed the antenna in the middle, where there is no "center segment"?

2. All X coordinates can be zero, as with a dipole, but since the wires will not be horizontal, how can we find the Y and Z coordinates that will make the wire lengths correct?

Modeling an Inverted Vee feedpoint

We'll look at two ways to approach this: the "split feed" and the "center wire feed".

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Split feed

First, let's construct an inverted vee antenna from two equal-length wires that meet at a point (the apex) and slant downward. Then we place a voltage source on each wire, in the segments adjacent to the common point (the last segment in one wire, the first segment in the other), as shown by the red circles in figure 1:

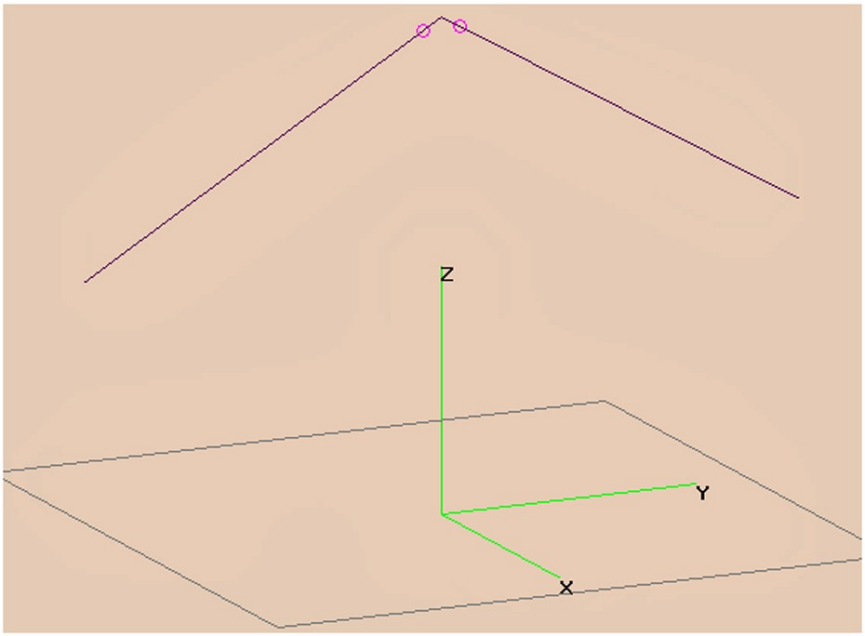

Figure 1

This arrangement is known as a "split feed". The antenna modeling program will calculate a single feedpoint impedance corresponding to the point between the sources. For best accuracy, the segment sizes of the two wires must be the same, and the number of segments should be large enough to make the segment size 1/20th of a wavelength or less. Here is an example antenna description:

Symbols

Nr	Symbols and equations	comment
1	HAG=20	Height of center
2	ENDY=14	Y coordinate of end point
3	ENDZ=11	Z coordinate of end point

Geometry (Scaling=Feet)

Nr	Type	Tag	Segs	X1	Y1	Z1	X2	Y2	Z2	Radius
1	Wire	1	10	0	-ENDY	ENDZ	0	0	HAG	#18
2	Wire	2	10	0	0	HAG	0	ENDY	ENDZ	#18

Source(s)

Nr	Type	Tag	Seg	(opt)	Real	Imag	Magn	Phase	(norm)
1	Voltage-src	1	100%	0	1	0	1	0	0
2	Voltage-src	2	0%	0	1	0	1	0	0

The result of a 4nec2 calculation for this antenna (over a moderate, real ground) is:

Filename	20M inv vee split feec	Frequency	14.06	Mhz
		Wavelength	21.32	mtr
Voltage	103 + j 0 V	Current	0.97 + j 0.76 A	
Impedance	66 - j 51.8	Series comp.	0.587	uH
Parallel form	107 // - j 136	Parallel comp.	1.537	uH
S.W.R.50	2.49	Input power	100	W
Efficiency	91.82 %	Structure loss	8.183	W
Radiat-eff.	55.49 %	Network loss	0	uW
RDF [dB]	6.64	Radiat-power	91.82	W

The calculated impedance has a negative reactance (-j51.8), so it is a bit short and will be resonant somewhere above 14.060 MHz. This is no surprise, as we were not careful in determining the length of the wires.

Center wire feed

A second approach to modeling the inverted vee describes the antenna using three wires, where the middle one is rather short, horizontal, and has only three segments. A voltage source is placed on the middle segment of this "center wire". The rest of the antenna is constructed of two longer wires, each connecting to one end of the center wire and slanting downward to form the inverted vee shape:

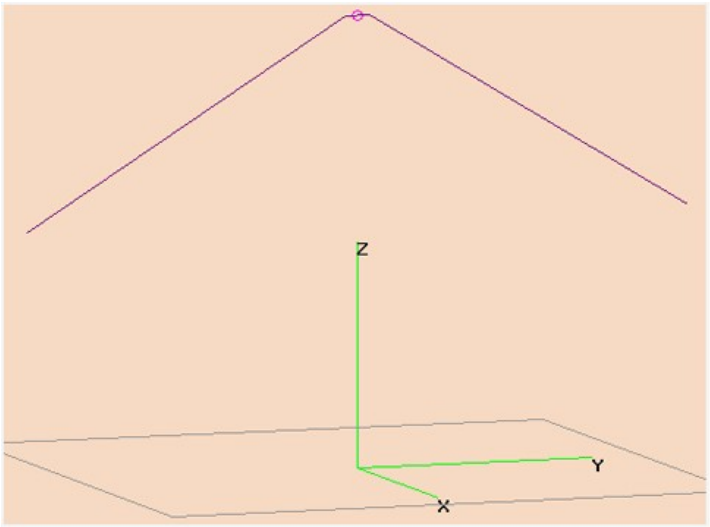

Figure 2

We'll define a symbol to represent the length of the center wire, **MIDLEN**, and make it 1.5 feet. With 3 segments, each segment will be 0.5 feet long. One of the guidelines for using NEC-2 suggests that when two wires join, their segment sizes should be similar. ¼ wavelength at 14.060 Mhz is about 17.5 feet. Because electrically each half of the antenna includes half of the center wire, each slanting wire will be a little less than 17.5 feet, so if we use 34 segments for these wires, the segment length will be in the neighborhood of 0.5 feet. Here is our antenna description:

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Symbols

Nr	Symbols and equations	comment
1	HAG=20	Height of center
2	MIDLEN=1.5	Center wire length
3	ENDY=14	Y coordinate of end point
4	ENDZ=11	Z coordinate of end point

Geometry (Scaling=Feet)

Nr	Type	Tag	Segs	X1	Y1	Z1	X2	Y2	Z2	Radius
1	Wire	1	34	0	-ENDY	ENDZ	0	-(MIDLEN/2)	HAG	#18
2	Wire	2	3	0	-(MIDLEN/2)	HAG	0	MIDLEN/2	HAG	#18
3	Wire	3	34	0	MIDLEN/2	HAG	0	ENDY	ENDZ	#18

Source(s)

Nr	Type	Tag	Seg	(opt)	Real	Imag	Magn	Phase	(norm)
1	Voltage-src	2	50%	0	1	0	1	0	0

For this antenna (over a moderate, real ground), the 4nec2 calculation result is:

Filename	20M inv vee (rjm).out		Frequency	14.06	Mhz
			Wavelength	21.32	mtr
Voltage	92.1 + j 0 V		Current	1.09 + j 0.57 A	
Impedance	66.3 - j 35		Series comp.	0.397	uH
Parallel form	84.8 // - j 161		Parallel comp.	1.818	uH
S.W.R.50	1.93		Input power	100	W
Efficiency	91.84	%	Structure loss	8.159	W
Radiat-eff.	56.06	%	Network loss	0	uW
RDF [dB]	6.62		Radiat-power	91.84	W

The impedance value is not quite the same as that of the split feed model. This is partly because the two different methods come up with slightly different answers. Also, each half of this antenna includes half of the length of the center wire, so this antenna is a little different in overall length.

Either feed method is workable. The split feed method is a little less complicated, but the single, center source is generally more accurate and flexible. For example, the single, center source would allow us to add a transmission line to the antenna model.

Controlling the length of sloping wires

In each of the models shown above, the end points of the non-horizontal wires are specified by setting the X coordinate to zero and using symbols ENDY=14 and ENDZ=11. The way in which we arrived at these values was not described, but in fact they were just guesses based on a center height of 20 feet and the standard formula where the length of a ¼ wavelength wire is 246 divided by frequency in MHz, or 246/14.06, or about 17.5 feet.

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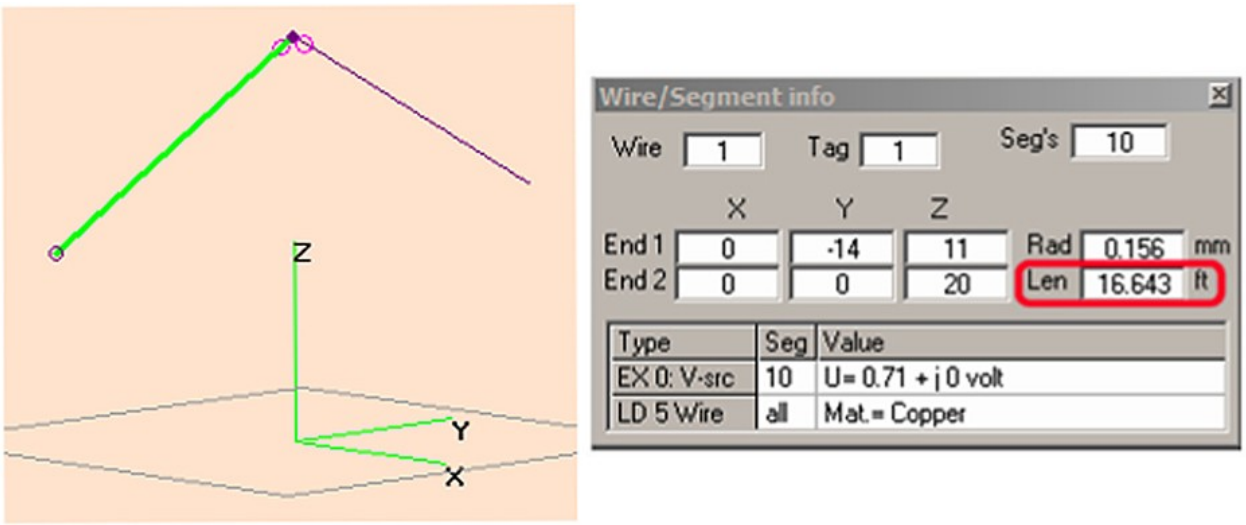
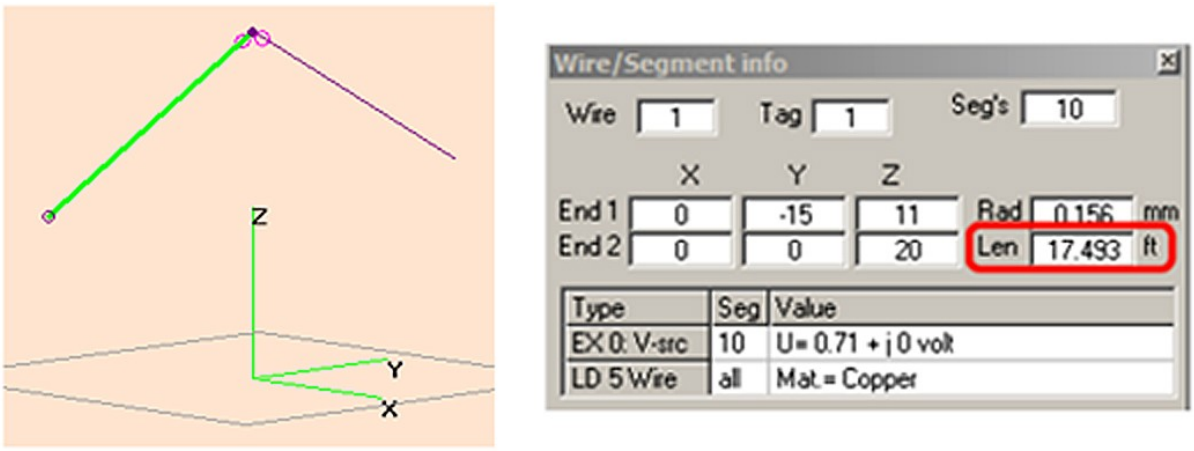
If we want each half of the antenna to be 17.5 feet long, and if the antenna is not horizontal, how can we figure out what endpoint coordinates will give us the length we want?

Incremental refinement

One way to arrive at a target wire length is to simply refine our guesses. Returning to the split feed model, notice that, in the Geometry window, we can click on any wire, which will then be highlighted in green. 4nec2 will display a "Wire/Segment info" window that tells us the actual length of the wire (among other things), as in **figure 3**:



If our target length is 17.5 feet, this wire is almost one foot short. If we move either the ending Y coordinate further out or the ending Z coordinate down, the wire will get longer. Let's change ENDY from 14 to 15. This gives:



Now the length of the two wires (they will be the same) is 17.493 feet (very close to 17.5). We can repeat the "guess-and-check" process until any exact length is obtained.

The Pythagorean Theorem: $a^2 + b^2 = c^2$

If we can simply decide upon either the Y or Z endpoint coordinate, then we can employ the **Pythagorean Theorem** to find the remaining value.

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Think of one wire of the antenna as the hypotenuse of a right triangle. The other two sides of the triangle are the horizontal distance along the Y axis and the vertical distance from the apex height, or "drop", of the lower endpoint of the wire.

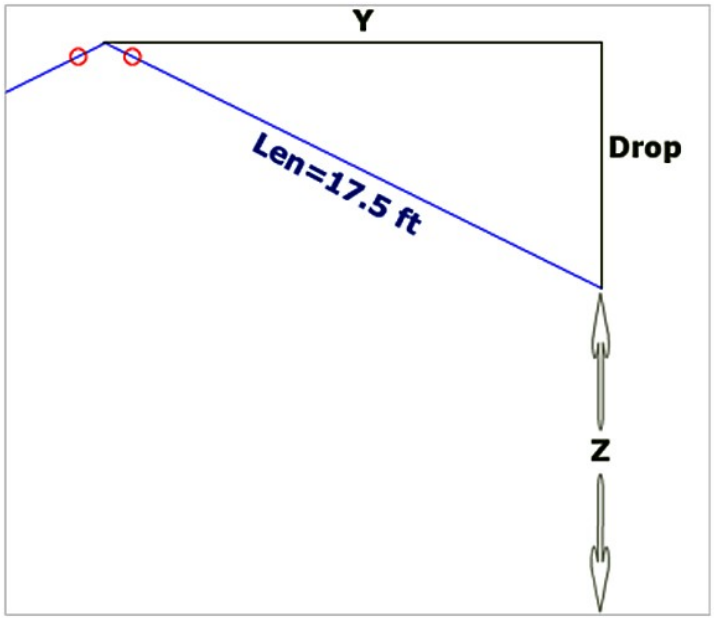

Figure 5

If we know either the distance Y or the Drop from the apex height above ground (HAG), we can solve for whichever quantity is unknown, using this equation:

$Y^2 + Drop^2 = Len^2$

Suppose we want our 17.5 foot wire to extend 14 feet (ground distance) from the middle of the antenna, because that's how far away one of our supports will be. That means Y in this equation is 14, and since we already know the apex (HAG) is 20, then if we can find Drop we'll know how far below 20 feet the end of the 17.5 foot wire will be. So let's fill in the known quantities and work with the equation:

$14^2 + Drop^2 = 17.5^2$, or

$Drop^2 = 17.5^2 - 14^2$, or

$Drop^2 = 110.25$, or

Drop = SQR(110.25), or

Drop = 10.5

Note: **SQR**(110.25) means we are taking the square root of 110.25.

Since the wire drops 10.5 feet from the apex height of 20 feet, we know that the Z coordinate of the lower endpoint of our inverted vee wire will be **HAG-Drop**, or (20 – 10.5), so **ENDZ= 9.5** (feet above ground).

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We can even get **4nec2** to do the math for us, using these symbol definitions (note **ENDZ**):

Symbols

Nr	Symbols and equations	comment
1	HAG=20	Height of center
2	LEN=17.5	1/4 wavelength, from 246/Frequency in MHz
3	ENDY=14	Y coordinate of end point
4	ENDZ=HAG - (SQR((LEN^2) - (ENDY^2)))	Z coordinate of end point computed, TNX Pythagorus

Simple trigonometry

Let's examine one more approach to finding coordinates for the end points of inverted vee wires. This time, we'll employ a couple of basic trig functions: **sine and cosine**.

Once again, let's view one wire of our antenna as the hypotenuse of a right triangle, this time noting that we can measure, or at least estimate, the angle A at which the wire slants from the horizontal.

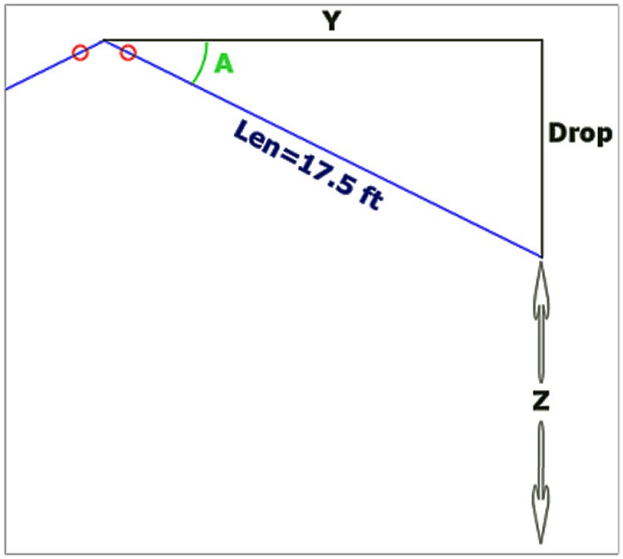

Figure 6

In this case, let's say A is 30 degrees. Thinking back to high school trigonometry (or maybe googling "trig functions" for a refresher course), let's recall that the ratio between the length of the hypotenuse (Len) of a right triangle and the side opposite the angle A is the "sine of A". For our example, In other words:

sin(A) = Drop / Len

Rearranging this equation, we have:

Drop = Len * sin(A)

If A is 30, then our favorite scientific calculator will tell us that sin(30) is 0.5, and we can figure that:

Drop = 17.5 * 0.5, or Drop = 8.75

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The end of the wire will be 8.75 feet below the apex (**HAG**=20), and 20 – 8.75 gives **ENDZ**=11.25.

Now recall that the ratio between the length of the hypotenuse (**Len**) of a right triangle and the side adjacent to angle **A** is the "cosine of **A**". For our example, in other words:

cos(A) = Y / Len, or Y = Len * cos(A)

Again, the calculator will tell us that **cos(30)** is 0.866, so we figure that:

Y = 17.5 * 0.866, or Y = 15.16

Now we know the endpoint of our inverted vee wire when the angle from horizontal is 30 degrees: X=0, **ENDY**=15.16 and **ENDZ**=11.25.

And, as with the Pythagorean method, we can get 4nec2 to do the math for us using these symbol definitions (note **ENDY** and **ENDZ**):

Symbols

Nr	Symbols and equations	comment
1	HAG=20	Height of center
2	LEN=17.5	1/4 wavelength, from 246/Frequency in MHz
3	A=30	Angle from the horizontal
4	ENDY=LEN * cos(A)	Y coordinate of end point
5	ENDZ=HAG - (LEN * sin(A))	Z coordinate of end point

In the Geometry window, we can click on an antenna wire to verify the results of our specification:

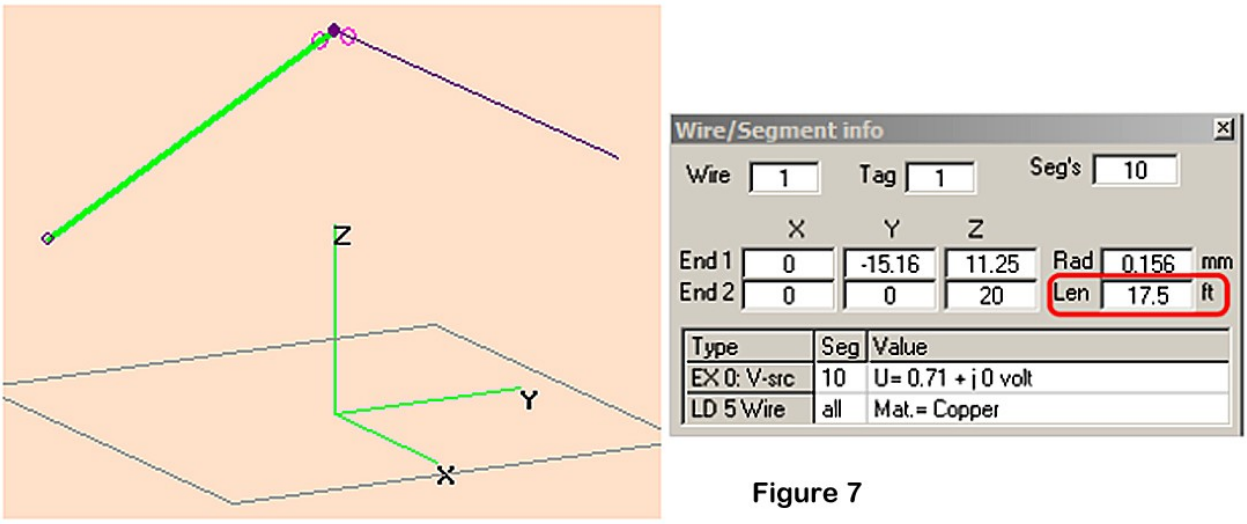

Figure 7

Here is the rest of the split feed inverted vee model, copied for easy reference from the beginning of this article:

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Geometry (Scaling=Feet)

Nr	Type	Tag	Segs	X1	Y1	Z1	X2	Y2	Z2	Radius
1	Wire	1	10	0	-ENDY	ENDZ	0	0	HAG	#18
2	Wire	2	10	0	0	HAG	0	ENDY	ENDZ	#18

Source(s)

Nr	Type	Tag	Seg	(opt)	Real	Imag	Magn	Phase	(norm)
1	Voltage-src	1	100%	0	1	0	1	0	0
2	Voltage-src	2	0%	0	1	0	1	0	0

And, finally, here's the result of a 4nec2 calculation for this antenna (over a moderate, real ground):

Filename	20M inv vee split feec		Frequency	14.06	Mhz
			Wavelength	21.32	mtr
Voltage	102 + j 0 V		Current	0.98 - j 0.55 A	
Impedance	79.1 + j 44.7		Series comp.	253	pF
Parallel form	104 // j 185		Parallel comp.	61.27	pF
S.W.R.50	2.28		Input power	100	W
Efficiency	92.52	%	Structure loss	7.482	W
Radiat-eff.	56.53	%	Network loss	0	uW
RDF [dB]	6.69		Radiat-power	92.52	W

This antenna has some positive reactance (+j44.7), so it's a bit long for the frequency we're using. That's because the "246/Frequency = ¼ wavelength" formula does not take into account something called "end effect", which makes antenna wires act a bit longer than they should. So as with most antennas we build, we will have to tweak **LEN** a bit to make the antenna resonant. "240/Frequency = ¼ wavelength" will give a better result.

With this model, you can explore the world of inverted vee antennas. Set **LEN** to the appropriate ¼ wavelength for your experiments, change **HAG** to try different heights, and change **A** to try different angles. You can even use negative values for **A** to simulate a flat-top dipole that droops under the weight of its feedline.
Happy modeling!

Radio Club of Tacoma
Board of Directors Meeting Minutes
February 3, 2016

Meeting called to order at 19:00 PST by President Gary WG7X.

Officers and Directors Present

President	Gary McAdams WG7X
Vice President	Mike Mikuchonis W7XTZ
Secretary	Mike Finnie W7MWF
Treasurer	Vacant (W7XTZ Acting)
Board	Alan Ferguson N7OMS
Board	Bruce Hanson WE7P
Board	Bob Jamison KE7WPK
Board	Paul Matney W7PFU

A quorum was present. 9 club members signed the attendance roster.

Silent Key or Illness Jeremiah Rose KF7ZPI got smacked by a car last Wednesday morning, resulting in multiple fractures to his right leg. He is convalescing at his home, and is expected to make a full recovery. Greta KF7KSW has sent a get well card to him.

The minutes of the January 6, 2016 Board Meeting were approved.

Secretary's Report Mike W7MWF reported the receipt of usual correspondence, memberships, and bank statements. He reported on the status of insurance coverage and that the banking and postal transition has been completed.

Treasurer's Report Mike W7XTZ provided financial reports of Balance Sheet and Income/ Expense Summary through January 31, 2016. Copies of the Treasurer's Reports are filed with these minutes.

Committee / Reports

Membership: George K7GRS reported that we currently have 255 active members and that renewals are still trickling in.

Training: Tech class will be held Feb 6 & 7, with VE Exam to be held Feb 9.

Info Tech: Randy is sick but by email reports all systems nominal.

HF Ops: Gary WG7X and Bruce WE7P reported all is well. Bruce will be mounting a large computer monitor on the south wall soon.

Rptr Ops: Andy KE7RTB reported that the team had travelled to Crawford Mountain site a couple of weeks ago, replaced and cleaned components. The repeater worked for a few days, but is now not producing audio. Another trip is planned when logistics can be arranged.

Facilities Mgmt: Bruce WE7P reported that a new thermostat has been acquired for the museum heat, but is awaiting electrician availability. Mike W7MWF reported that the additional stair rail has not yet been done.

Meeting Minutes cont'd….

Property Mgmt: Mike W7MWF reported that $455 was made at the Mineral Winterfest and at the Club mini-swapmeet over the weekend of January 29th. Andy KE7RTB provided an update and briefing on the recent reactivation of the EBay sales program. He reported the sale of our first item, a vintage microphone, for $125.

Weds Activity Night The January Activity Night consisted of an ARDF presentation and practice facilitated by Rich KR7W. Activity for February meeting not yet available

General Meeting: Dave W7UUU will provide a program will be a fun video presentation of the 37 Year History of Amateur Radio station W6RO of the Associated Radio Amateurs of Long Beach aboard HMS Queen Mary in Long Beach Harbor, California.

Unfinished Business

Centennial Planning: No updates
Tower Inspection: No updates
Bylaws Amendment The updated Bylaws have been posted to the Club website.

New Business

Gary WG7X reported he had been contacted by an Emergency Management Officer in coastal Washington about assistance building go-kits. Gary will forward the email to the Board and to the other Usual Suspects.

Mike W7MWF reported that the Club had been notified about a possible Community Service Impact Grant. He will research and report back to the Board regarding its legitimacy and implications.

Activity Reports and Discussion Topics

FYBO (upcoming) Contest and ARDF will be held at Rhodie Garden, Point Defiance Park February 6, with setup beginning around 08:00 PST. Dress warmly.

Announcements Mike and Key Hamfest March 5th. The Club will have2 sales tables and an info booth (sharing info table with ARES)

The meeting was adjourned at 19:32 PST

Radio Club of Tacoma
General Membership Meeting Notes
February 10, 2016

Meeting called to order at 1930 by Gary WG7X at the Pierce County Library Administration Building.
There were 32 names on the sign in sheet.

Officers and Directors Present

President Gary McAdams WG7X
Vice President Mike Mikuchonis W7XTZ
Secretary Mike Finnie W7MWF

Pledge of Allegiance was led by Gary WG7X

Welcome - Self-Introductions were completed and guest Mike AJ7MH was greeted.

Health and Welfare Jeremiah Rose KF7ZPI suffered a broken leg as a result of a car/pedestrian collision. He is recuperating at home and expected to make a full recovery.

Secretary's Report Mike W7MWF reported recent mail included subscriptions, insurance policies, and a couple of QSL cards. Membership renewals are still trickling in.

Treasurer's Report - No report. The Field Day Pig and Suggestion Box were passed around.

Club Award Presentations Dave W7UUU provided a brief overview of the Loggers Certificate program and announced reissue of old certificates to Bob K7MXE (formerly KN7MXE) and himself (formerly WB7AWK). Newly minted recipients were Anne N7ANN and Mike W7MWF. Dave also displayed an old QSL card sent by Bob KN7MXE when he was 13 years old.

Committee / Activity Reports
Membership - George K7GRS reported that membership stands at approximately 270

VE Report - John AC7WW submitted the VE Report noting that at the Feb 9 session, 23 exams were graded resulting in 8 Technicians, 2 Generals and one upgrade to Extra Class. VEs participating were Jan K7HTU, Rich KK7VH, Gary K7EK, Charles AE7BM, John AD7AW, Mike W7XH, Stephen AD7AB and Whit KG7LNZ. The next testing session will be Tuesday, March 8, 2016

Training – Next Tech Class March 5/6

FYBO/Bunny Hunt – Randy WB4SPB provided a recap of the activity held on Saturday. There were fewer contacts made than usual, but a good time was had by all. Over a half-dozen teams participated in the hidden transmitter hunt.

4th Weds Activity Night – Randy WB4SPB announced that the activity nights for February and March will be about antenna modeling using computer software programs. The dates are Feb 24 and March 23. Randy noted that he wrote an article for the February Log

gers' Bark Club Newsletter and strongly recommended members read it as a primer for the upcoming workshops. The Bark is available on line at the club website w7dk.org

Program – Dave W7UUU provided a fascinating slide show and movie about the history and operations of Amateur Station W6RO sited aboard the Queen Mary in Long Beach, California. Dave and Ann had the opportunity to operate the station during a recent trip to the area.

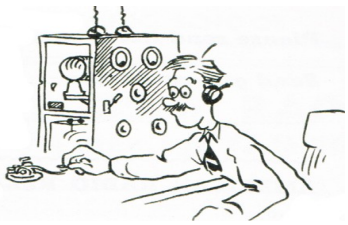
Announcements - Mike and Key Flea Market will be March 5 at the Puyallup Fairgrounds. W7DK will be hosting 2 sales tables downstairs and an info table upstairs.

The weekend prior to that, on the last Saturday of February 2/27 at the Clubhouse the Property Management Team will hold a tailgate sale of merchandise selected for M&K Sale to afford club members an opportunity to buy items.

Show and Tell – Dave W7UUU showed us his new Triple Play.

The meeting was adjourned at 2042.

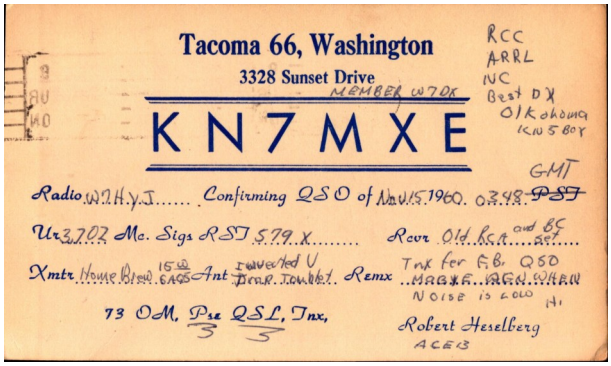
56 Years Ago In Ham Radio

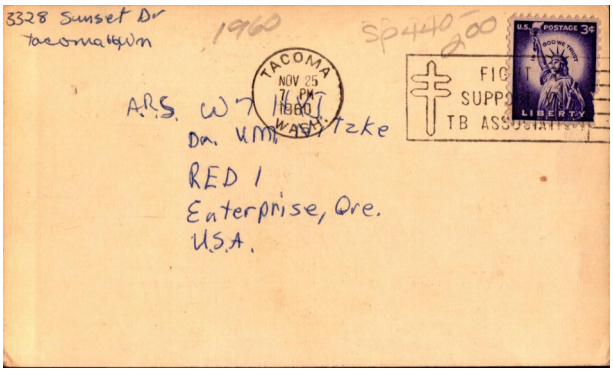


I sometimes see ads in the back of QST and CQ magazine for "your" old QSL card– where the vendor has collected a gazillion old QSL cards and will look and see if he has the one I am after. Many times I've requested WN7BDJ– my first call sign, but alas– no cigar.

Just recently– fate would have it- club member and volunteer Bob– K7MXE has one of his early Novice Days QSL cards come home after almost 56 years later without even requesting it.

Dave, W7UUU reports that while visiting the antique mall in Paulsbo he found the QSL card of a familiar call. Dave bought it and presented it to the former young Robert KN7MXE who sent out to confirm a QSO with W7HYJ in Enterprise, OR.





I interview Bob about his equipment and antenna to accomplish this QSO. Turns out that Bob used a single tube 6AQ5 transmitter, 15 watts input power (maybe 5W output) built by Jack K7DBU– another RCT member and volunteer. As I understood Bob– his receiver was an old RCA shortwave receiver that was not capable of detecting Morse code signals. Bob added a BFO (beat frequency oscillator) signal to the RCA receiver from a AM broadcast receiver in order to hear the Morse signals as an off/on tone. Bob indicates his antenna as an 80 meter trap doublet. Note that the card says "Best DX Oklahoma". Thanks Dave for scanning the card and sending it to the Bark.

The Classic Exchange

Randy WB4SPB [LINK] operates as W7OS in the CX

Radio Sport– NAQP, Sweepstakes, Salmon Run, CQWWDX– are all familiar ham radio contests. But did you know there is a radio sport event for Boat Anchor radios? It's called the Classic Exchange, aka 'CX'. The CX is a no-pressure contest celebrating the older commercial and homebrew equipment that was the pride and joy of ham shacks many decades ago. The object is to encourage restoration, operation and enjoyment of this older Classic equipment. However, you need not operate a Classic rig to participate in the CX. Any rig may be used in the contest– but using new gear has a distinct scoring disadvantage. If the ham op doesn't have classic old equipment and still wants to make QSOs with "The Great Ones"… then go for it– use modern day transceivers.

See next page...

The CX has two operating modes– CW and Phone. This year the CW event took place on Sunday Jan 31 and Tuesday Feb 2. Then two weekends later– the Phone (AM and/or SSB) portion of the event. Superbowl organizers reluctantly agreed to hold their event during the weekend between the two CX weekend events.

This year two W7OS Museum staffers operated the CW portion for approx 3 hours on Sunday and one came back to see if anyone was participating on Tuesday.

Since this is radio sport… and for an event to be a sport– there must be a score and rules to calculate the score. The CX rules say– to calculate the score– first the CX multiplier– which is the total number of the ages of each piece of equipment used– must be added up. W7OS used a Heathkit VF1 exciter= 64 years old, a Heathkit Apache transmitter= 57 years, Harvey Wells TBS50 transmitter= 66 years, Collins 75A4 and R388 receivers= 61 and 66 years respectively, and a Drake 2NT transmitter= 49 years old. CX multiplier for W7OS= 363 years. The number of QSOs is multiplied by the CX multiplier.

W7OS made 29 QSOs x 363 years = 10,527 points. But wait!! There's bonus points. If any of the equipment used is the same as any of the operator's Novice station had… then 2,000 additional points are awarded. Also, if a Heathkit product was used in the contest then 2,000 bonus points may be added. Neither Randy WB4SPB or myself-KR7W used any of the above rigs in our old days– but we did use two Heathkit rigs– which makes W7OS' grand total score 12,527 points. Is that a lot of points? 2015's high scorer, Rocco N6KN achieved 567,432 points. Jim W8KGI, (mentioned below) scored 374,166 for second place. I suppose that W7OS might have been a front-runner if we had operated the entire 18 hour period instead of just three hours. None the less– I thought it was just as much fun as Field Day.

Date	UTC Time	CALL	BAND	RST RCV / SENT	W7OS RIG	FAR HAM's RIG	W7OS OP
01/31/16	2250	N6KN	20	599 / 579	VF1+Globescout+R388	NCX5; Op Rocco in CA	KR7W
01/31/16	2255	K5BZH	20	569C / 579	VF1+Globescout+R388	Icom IC7000 / 90W; Op Jim in TX	KR7W
01/31/16	2308	W0/OK1MT	20	589 / 579	VF1+Globescout+R388	FT950 / Op Jan- Vac in Aspen, CO	KR7W
01/31/16	2323	VA7JC	40	599 / 599	Drake 2NT + Collins 75A4	Yasesu FTDX1200 / 100W / attic Inv Vee, Op Jon in Surry, BC	WB4SPB
01/31/16	2348	WB2AWQ	40	579 / 579	Drake 2NT + 75A4	TX=HB8075 / RX=NC125, Op Howie in NV	WB4SPB
01/31/16	2336	W2JAZ	40	459 / 589	Drake 2NT + 75A4	Drake TR7, Rick in NJ	WB4SPB
01/31/16	2315	W0PER	20	578 / 579	VF1+Globescout+R388	Ten Tec Delta2+VF1+Viking 2, Op Steve	KR7W
01/31/16	2350	W8KGI	20	559 / 569C	VF1+Globescout+R388	TX=Valiant / RX=NC303	KR7W
01/31/16	2355	W8KGI	20	Unrecorded	VF1+Globescout+R388	TX=Hallicrafter HT20 / RX= National HRO-5	KR7W
02/01/16	0025	N6KN	40	569 / 559	VF1+Harvey Wells+R388	TX= Collins 32S3 / RX=Collins 51J4, Rocco in CA	KR7W
02/01/16	0025	W2IQK	40	Unrecorded	VF1+Harvey Wells+R388	All HB (dunno what this is)	KR7W
02/01/16	0027	WB2AWQ	40	579 / 559	VF1+Harvey Wells+R388	TX=Millen 90800 / RX= ca WW2 BC348. Howie in TX	KR7W
02/01/16	0047	KL3QI	20	579 / 569	Drake 2NT + 75A4	Kenwood TS590S / 100W / Vert, Op Tom in AK	WB4SPB
02/01/16	0103	JA3KNB	20	579 / 539	Drake 2NT + 75A4	Drake TR4 / Op=KAZU / In Osaka	WB4SPB

Here's some of W7OS's CX Log. Note the Far Ham's Rig column. If the ham in TX with the IC7000 rig can make QSOs with the "Great Ones"…. So can you. **Go to Next Page….**

The CX encourages Japanese hams to participate– as I know that there is a large amount of JA hams who are boat anchor radio enthusiasts. The rules state that there is a one hour window at 0000 UTC for 15 meters… and another one hour beginning at 0100 for 20 meters. W7OS made one 15M and one 20M QSO with JA hams. One ham didn't seem to know he was in the CX. The other proudly announced that his rig was a Drake TR7– sorta old.

One ham W7OS contacted must live for the CX and prepare all year long. KR7W made contact with Jim W8KGI in NM who used 9 different combinations of radios all in a row that equated to 9 separate QSOs. Some of his transmitters sounded distinctively different. Some with hum, some with CW Chirp, some sounded modern. It was fun to help Jim test his work and make some points.

KR7W at the key on 40 M the Heathkit VF1 VFO as an 'exciter' to feed the Harvey Wells TBS50 Transmitter. The old military R388 is the receiver.

The Doc Spike W7OS Museum Report

By Rich KR7W– Unofficial Museum Curator

Big Ideas: There's a pretty wide shelf on the northeast wall. The shelves contain a some valuable pieces of ham radio history– as a well as a lot of 'never to be used' junk. The plan is to remove all items on to the floor and get rid of the junk, place the remaining valuable items in storage, then dismantle the shelf to be repurposed.

After the shelf is gone– carpentry tools will be brought in and the door to the north attic storage space will be rebuilt to add a face frame and hinges. The rebuilt door will swing open to where the shelf used to be. The improvement is to have the door close better without any gaps and to stay shut. The hope is that the attic storage space will be easier to do business with.

The dismantled shelf parts will be repurposed to become a more narrow unit that will fit on the same wall– but not in the way of the rebuilt door.

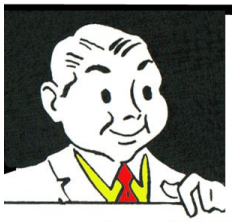
The heat in the Museum has been OFF due to a bad thermostat in the wall heater. It should be fixed before summer time.

The Museum workbench has a small cubbie that contains electronic work tools. Recently I needed some of those tools and they were missing… as well as a precision screwdriver kit. I will replace the missing tools– but after I do… the cubbie door will be padlocked. Clubhouse hosts will have access. The newly rebuilt door to the attic storage will also be padlocked.

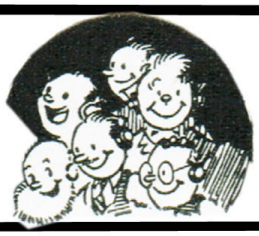
End of Report. 73 KR7W

Did You Know?

In 1921 an RCA 5 watt Transmitting tube costs $8 and could outperform a 500 watt Spark Transmitter? 50 Watt Tubes cost $30 and were 5 X more effective than the best 1KW Spark Transmitter



The Logger's Bark Photo Page



Left: It's Mike W7XTZ at the 40 Meter CW+SSB station participating in RCT's 2011 Field Day. If memory serves me correctly– this was Mikes first FD. Mike spent hours at the mic and made 140 QSOs for Team DK.

KR7W's NPOTA station—Mt Rainier National Park– set up at a picnic area at mile 3.7 along the trail from the Carbon River Ranger station to Ipsut Creek Campground. 2/25/2016. Nice day, eh? No rain today.

The station operated CW and SSB with an Elecraft KX3 at 8 watts. The antenna was a Dan's 44 ft doublet at the top of the 20 ft fish pole shown in the photo.

A surprising amount of QSOs were made. Looks like ARRL's NPOTA is very popular– like last years ARRL Centenial Celebration On the Air activity.

Radio Club of Tacoma

1916 - 2016

100 Years of Service

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Radio Club Repeaters

Central Tacoma:	147.280 + PL=103.5	
Crawford Mountain	147.380 + PL=103.5	(E of Olympia @ 1800 ft ASL)
Central Tacoma:	440.625 + PL=103.5	
North Tacoma:	145.21 – PL=141.3	

www.w7dk.org [LINK] - For the latest and most current information on events and activities, visit the Radio Club of Tacoma Website.